Physician Productivity in Specialty Care

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PREFACE

The VA Evidence Synthesis Program (ESP) was established in 2007 to conduct timely, rigorous, and independent systematic reviews to support VA clinicians, program leadership, and policymakers improve the health of Veterans. ESP reviews have been used to develop evidence-informed clinical policies, practice guidelines, and performance measures; to guide implementation of programs and services that improve Veterans' health and wellbeing; and to set the direction of research to close important evidence gaps. Four ESP Centers are located across the US. Centers are led by recognized experts in evidence synthesis, often with roles as practicing VA clinicians. The Coordinating Center, located in Portland, Oregon, manages program operations, ensures methodological consistency and quality of products, engages with stakeholders, and addresses urgent evidence synthesis needs.

Nominations of review topics are solicited several times each year and submitted via the ESP website. Topics are selected based on the availability of relevant evidence and the likelihood that a review on the topic would be feasible and have broad utility across the VA system. If selected, topics are refined with input from Operational Partners (below), ESP staff, and additional subject matter experts. Draft ESP reviews undergo external peer review to ensure they are methodologically sound, unbiased, and include all important evidence on the topic. Peer reviewers must disclose any relevant financial or non-financial conflicts of interest. In seeking broad expertise and perspectives during review development, conflicting viewpoints are common and often result in productive scientific discourse that improves the relevance and rigor of the review. The ESP works to balance divergent views and to manage or mitigate potential conflicts of interest.

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Operational Partners

Operational partners are system-level stakeholders who help ensure relevance of the review topic to the VA, contribute to the development of and approve final project scope and timeframe for completion, provide feedback on the draft report, and provide consultation on strategies for dissemination of the report to the field and relevant groups.

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DISCLOSURES

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The findings and conclusions in this document are those of the author(s) who are responsible for its contents and do not necessarily represent the views of the Department of Veterans Affairs or the United States government. Therefore, no statement in this article should be construed as an official position of the Department of Veterans Affairs. The final research questions, methodology, and/or conclusions may not necessarily represent the views of contributing operational and content experts. No investigators have affiliations or financial involvement (eg, employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties) that conflict with material presented in the report.

Main Report

Evidence Synthesis Program

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ABBREVIATIONS TABLE

Abbreviation	Definition
AMA	American Medical Association
CMS	Centers for Medicare and Medicaid Services
CPT	Current procedural terminology
DEA	Data envelopment analysis
FTE	Full-time equivalent
GEE	Generalized estimating equivalents
MGMA	Medical Group Management Association
OLS	Ordinary least squares
OPES	Office of Productivity, Efficiency, and Staffing
RUC	Relative Value Scale Update Committee
SHEP	Survey of Healthcare Experience of Patients
VA	Veterans Affairs
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Network
RVU	Relative value unit
RBRVS	Resource-based relative value scale
wRVU	Work relative value unit

BACKGROUND

Productivity is a term used in the health care context to refer to the work output from physicians and other clinical staff relative to the time and other resources available to complete that work. How to measure physician productivity accurately and fairly has been a perennial topic of debate. In the current era, most US health systems use work relative value units (wRVUs) as a surrogate measure to approximate physician work output given the lack of another standard measure. Representing 1 component of the 3-component resource-based relative value scale (RBRVS), which also accounts for practice expenses and malpractice insurance costs, wRVUs assign a numerical value to physician work output according to current procedural terminology (CPT) codes applied to a patient visit or procedure.[1] Although wRVUs were first used in 1992 by the Health Care Financing Administration (now the Centers for Medicare & Medicaid Services [CMS]) for the purposes of standardizing a Medicare fee schedule, the wRVU system of valuing clinical services has been widely adopted by state Medicaid programs and commercial payers.[2] Therefore, across the range of clinical services provided in the US, most are coded according to CPT and assigned value via wRVUs, making wRVUs a readily available source of information to estimate physician work output. Many health care systems use metrics based on wRVUs, such as total annual wRVUs, to set physician productivity standards (or benchmarks), design physician payment and incentive plans, and allocate resources across clinical services. Use of electronic health records (EHRs) also facilitates use of wRVU data, given that CPT codes are typically part of clinical encounter documentation.

However, despite the widespread use of wRVU-based metrics in health care management decisions, physicians across multiple specialties have expressed concerns about how clinical services are valued in the RBRVS system, the implications of valuing (and therefore charging higher prices for) certain services more than others, and the downstream implications of using wRVUs as a stand-alone measure to assess physician work output.[3,4]

The American Medical Association (AMA) maintains CPT codes, which became the national coding standard for physician and other health care professional services and procedures under the Health Insurance Portability and Accountability Act (HIPAA) in 2020.[5] The AMA also makes annual recommendations to CMS on fee schedule changes based on input from a Relative Value Scale Update Committee (RUC) that meets throughout the year but conducts its deliberations privately (*ie,* outside of public view).[6] According to the AMA, CMS typically accepts more than 90% of the RUC's recommendations.[6] A long-standing critique of this arrangement, by which CMS seems to have largely outsourced decision-making regarding Medicare fee schedules to the AMA, is that higher-cost, resource-intensive clinical services, such as procedures, are preferentially valued over evaluation and management services, the so-called "cognitive services" in which the resource being used is the physician's time and clinical judgement.[1,7–9] In addition to primary care, internal medicine subspecialties with an outpatient focus including rheumatology, endocrinology, infectious diseases, and pulmonary care are impacted by this chronic undervaluation.[9]

The initial framework of the RBRVS was designed to be applied to procedural services; cognitive services were incorporated later in the process.[10] Part of this legacy is that a small number of CPT codes exist for evaluation and management services compared to an expansive list of CPT codes for procedural-based services. Physicians providing evaluation and management services have limited choice of CPT codes to assign to an increasingly broad spectrum of outpatient service complexity, which disadvantages physicians in cognitive specialties and contributes to the undervaluation of their clinical services. While many procedures and diagnostic tests have become more efficient and less

time intensive over time due to technology improvements, outpatient medicine has become more complex and more time intensive as the population ages and has a higher burden of chronic diseases.[11] Yet CPT codes and associated wRVUs have not evolved along with these trends. Moreover, CPT codes do not capture work that is completed outside of a patient encounter, such as reviewing records, refilling medications, communicating lab and imaging results, responding to patient messages, coordinating care across services, and managing population health.[12] The time required to complete these non-billable "asynchronous" clinical work activities has been trending up over time and sharply increased with the onset of the COVID-19 pandemic and a shift away from face-to-face patient care.[13,14] These asynchronous clinical work activities are a core component of outpatient medical care but are often "not observable or not observed" and therefore not captured in wRVU-based metrics, even though these activities improve care quality and reduce costs.[15]

Although VHA operates as a capitated health care system based on the distribution of Congressionally appropriated funds across Veterans Integrated Service Networks (VISNs) and therefore does not depend on wRVUs as a primary means of payment (although it does bill third-party payers for some health care services), wRVUs are still used by VHA decision-makers as a surrogate measure for physician work output. According to VHA Directive 1065,[16] specialty group practice productivity is defined as clinical work completed (the group's total wRVUs) divided by the time available to do that work (the group's total clinical time, full-time equivalent [FTE]). The range of acceptable productivity falls within the interquartile range (25th to 75th percentile) of the comparator. In past years, specialty group practice productivity has been compared to historical VHA performance, but as of fiscal year 2026 (FY26) the VHA will be primarily using Medical Group Management Association (MGMA) academic median benchmarks to determine productivity standards.[17] The Office of Productivity, Efficiency & Staffing (OPES) "assists VHA leadership in developing effective management tools, systems, and studies to optimize clinical productivity and efficiency so that informed staffing decisions are made."[18] Underperforming groups identified with OPES management tools may be referred to the VISN Director for review and development of performance improvement plans.

Although VHA's reasons for using wRVU-based metrics primarily relate to staffing rather than billing, the same concerns about using wRVUs as a surrogate for physician work output in non-VA health care settings apply to the VHA context. The purpose of this report is to review the available evidence on physician productivity measures to identify potential alternatives to wRVU-based metrics. This report was requested by the Specialty Care Services and Chiefs of Medicine Field Advisory Board and therefore focuses on medical specialty physicians delivering care in the outpatient setting. Given an interest in understanding the size, range, and characteristics of available evidence, we opted to conduct a scoping review, which is a type of systematic review that identifies main themes across a body of literature.[19] The findings of this report may inform VHA activities related to measuring physician productivity.

METHODS

REGISTRATION AND REVIEW

A preregistered protocol for this review can be found on the PROSPERO international prospective register of systematic reviews (CRD42024622073). A draft version of this report was reviewed by external peer reviewers; their comments and author responses are in the Appendix.

KEY QUESTIONS AND ELIGIBILITY CRITERIA

The following key question was the focus of this review:

- *Key Question 1 (KQ1)*: What measures and models have been evaluated to assess medical specialty physician productivity in ambulatory settings (including time and effort spent in indirect clinical activities such as population health management and care coordination)?

Study eligibility criteria are shown in the table below.

Domain	Eligibility Criteria
Population	Physicians, prioritizing medicine specialty physicians but including studies of primary care physicians if studies otherwise meet eligibility criteria
Intervention	Physician clinical productivity measures or models implemented or tested with real-world data
Comparator	Any
Outcomes	Productivity outcomes, health care quality outcomes, patient-reported outcomes, cost, care coordination outcomes, or unintended consequences
Setting	Ambulatory care, including care delivered via telehealth
Study Design	Any, but may prioritize studies to fit timeline based on a best-evidence approach

For the purposes of this report, we used the following definitions for key terms based our reading of background literature.

Term	Definition Used in this Report
Productivity	Work output divided by time and/or other resources to complete that work
Workload	Total quantity and/or type of work tasks that must be completed in a given timeframe
Efficiency	Work output divided by the cost (*ie,* time or effort) of completing that work
Value	Quality divided by cost (*ie,* time or effort)

SEARCHING AND SCREENING

To identify articles relevant to the key question, a research librarian searched MEDLINE (Ovid), Cochrane, and Scopus databases from inception through December 2024 using terms for *productivity* and *workload* (see Appendix for complete search strategies). Additional citations were identified from hand-searching reference lists and consultation with content experts. English-language titles, abstracts,

and full-text articles were independently screened by 2 reviewers, and disagreements were resolved by consensus.

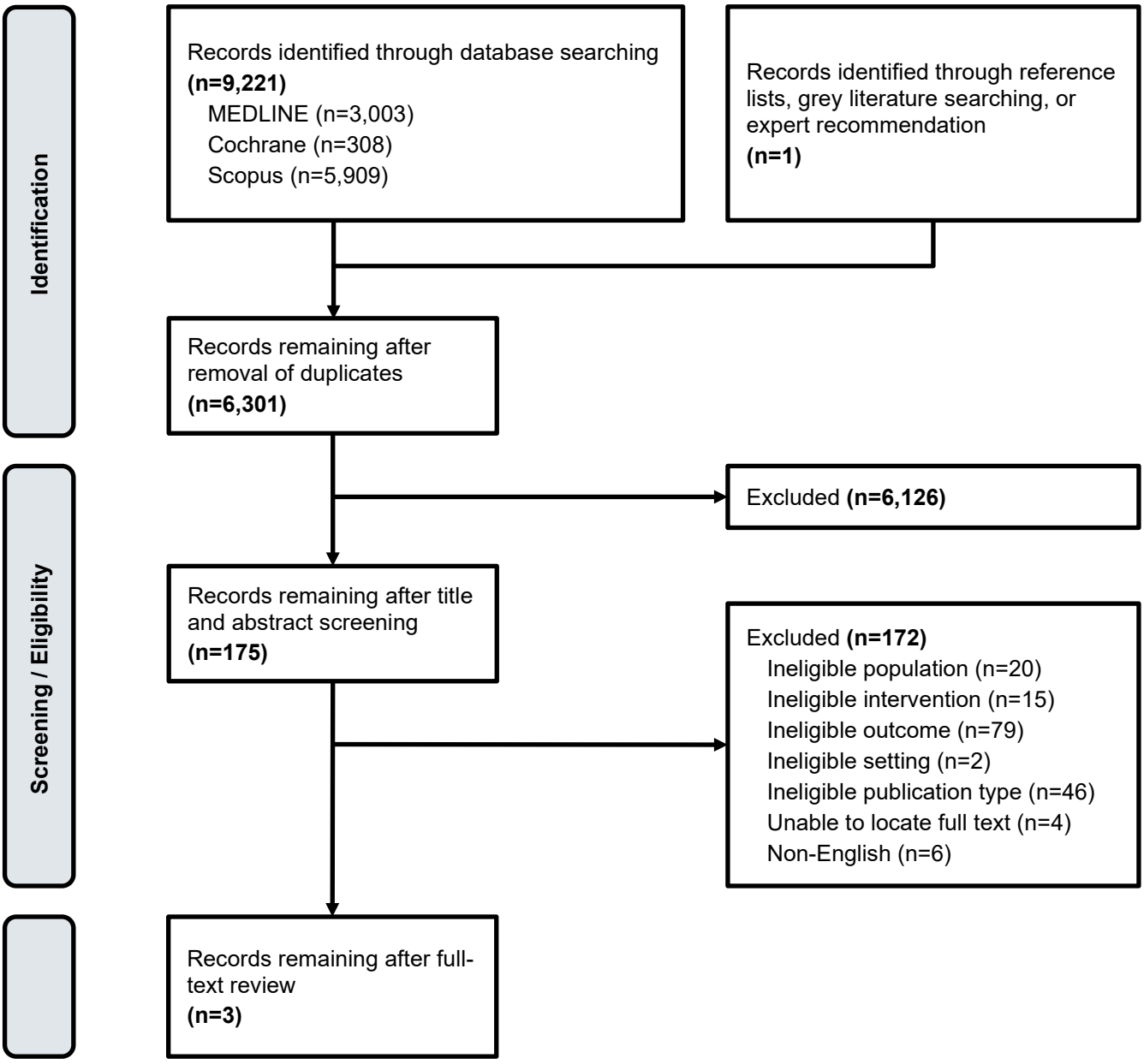
DATA ABSTRACTION AND SYNTHESIS

One reviewer abstracted population, intervention, comparator characteristics, and outcome information from all included studies. Data were checked by another reviewer and disagreements were resolved by consensus. We present themes across the available evidence but did not formally assess risk of bias of individual studies or assess the strength of the body of evidence for a given outcome. This approach is consistent with scoping review methods.[19]

RESULTS

LITERATURE FLOW DIAGRAM

The literature flow diagram summarizes the results of the study selection process. A full list of excluded studies is provided in the Appendix.



OVERVIEW OF INCLUDED STUDIES

Our search identified 174 potentially relevant articles after deduplication and title and abstract screening. Of these, 3 observational studies[20–22] met eligibility criteria. All 3 were conducted in the US and 2 were conducted in VHA settings. Two studies evaluated productivity measures for specialty physicians and 1 developed a productivity model for primary care. Study characteristics are presented in Table 1.

Table 1. Characteristics of Included Studies

Study	N	Setting	Study Aim	Data Source	Statistical Method(s)
Butala 2019	56 cardiologists	Cardiology practice at an academic medical center	Develop a method to measure individual physician outpatient clinical productivity accounting for shared practice resources	Administrative scheduling and hospital data and conversations with practice staff	Compared sequential mixed effects models to GEE and DEA models
Saeed 2024	654 providers in 32 clinics	VHA cardiology and orthopedics clinics	Propose a new work input measure ("clinical time") to replace FTE in productivity calculations	VA Corporate Data Warehouse	Used OLS regression models to validate measures using wait time as an outcome
Tran 2024	703 clinics	VHA community-based outpatient (primary care) clinics	Develop and test a multi-dimensional measure of primary care clinic productivity	Healthcare Effectiveness Data and Information Set, VHA Survey of Healthcare Experience of Patients, and VA Corporate Data Warehouse	Used DEA to calculate efficiency scores measuring the degree to which clinics maximized primary care outputs given available FTE

Abbreviations. DEA=data envelopment analysis; FTE=full time equivalency; GEE=generalized estimating equations; OLS=ordinary least squares; VHA=Veterans Health Administration.

Two studies[20,21] of specialty clinics evaluated methods to calculate individual physician productivity by adjusting the measure for work inputs (the denominator in the "output/input = productivity" equation), and 1 study[22] of primary care clinics introduced a new model to evaluate clinic-level productivity with novel measures for both work outputs and inputs.

One of the specialty clinic studies, an observational study[20] based on 2015-2016 data from 56 cardiologists at an academic medical center, used a mixed-effects model to calculate individual physician productivity after adjusting for the effect of shared practice resources (such as exam rooms) and team-based care (nurse practitioner, fellow, and secretarial FTEs). Rather than wRVUs, the study used completed patient visits per half-day per week as the work output measure (the numerator in the "output/input = productivity" equation). By sequentially evaluating 3 mixed-effects models, authors found that adjusting for shared practice resources reduced variation among individual physicians by more than half, representing a way to evaluate productivity more fairly.

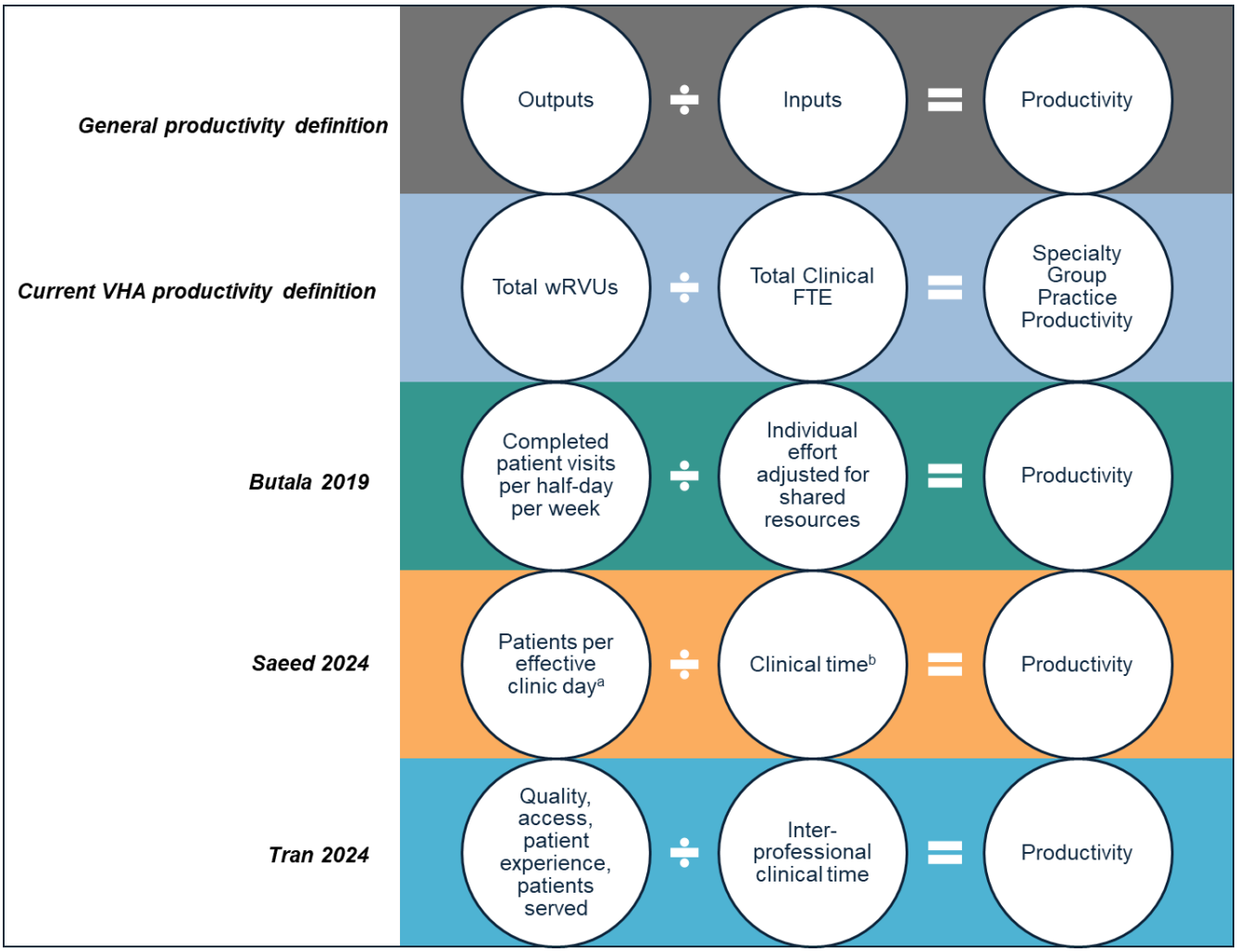
A second specialty clinic study[21] used 2018–2020 data from 32 VHA cardiology and orthopedics clinics representing 654 providers to compare productivity calculations using FTE as the measure of

work input to a new measure called "clinical time," defined as "the amount of time between the start of the first appointment of the day and the estimated end time of the last appointment of the day for each provider." This value in minutes was then divided by 8 hours to calculate clinical time in days, or "effective clinical time." The authors' reasoning for devising this new "clinical time" measure was based on the observation that FTE information is typically self-reported and lacks a consensus definition. While some health systems or clinics may define clinical FTE as a proportion of a 40-hour work week, others may use a different standard or incorporate nonbillable clinical time. Moreover, self-reported FTE information is typically updated infrequently, while "clinic time" can be updated closer to real time using administrative data. The study used patient visits per "effective clinic day" as the work output measure and found that this measure provided a more accurate prediction of clinic access than patients per day per FTE.

A third observational study based on FY19 VHA data from 703 community-based outpatient (primary care) clinics developed a novel metric with the aim of linking investments in team-based primary care to multiple value-based primary care products. In this model, productivity inputs consisted of interprofessional clinical time calculated according to the sum of FTE for all members of the patient care team. Productivity outputs consisted of: 1) *clinical quality* based data from the Healthcare Effectiveness Data and Information Set; 2) *access* using a validated composite measure using VA's Survey of Healthcare Experience of Patients (SHEP); 3) *patient experience* based on SHEP data; and 4) *number of patients served* by each clinic based on VHA administrative data adjusted for patients aged 70 or older and the percent expected to have higher-than-average costs. Inputs and outputs were used to calculate a technical efficiency score reflecting the degree to which clinics maximized outputs given their available inputs. Authors propose that these efficiency scores could be used to meaningfully guide productivity improvements that align with value (not volume)-based outcomes important to patients and physicians.

An overview of how these 3 observational studies defined measures of work input and output compared to VHA's current productivity definition is presented in Figure 1.

Figure 1. Productivity Definitions in VHA and Included Studies



Notes. [a] Defined as "clinical time" in days; [b] Defined as "the amount of time between the start of the first appointment of the day and the estimated end time of the last appointment of the day for each provider."

DISCUSSION

The purpose of this scoping review was to describe the size, range, and characteristics of available evidence on measures of specialty medicine physician productivity. We found that the existing literature base on this topic is small with a limited range. Studies included cardiology clinics but lack data from other medicine specialties.

The 3 observational studies we identified all aimed to improve upon wRVU-based productivity measures but differed in their approach. Two studies[20,21] of cardiology clinics evaluated ways to modify measures for work input (the denominator in the "output/input = productivity" equation) while continuing to use a volume-based measure (patient visits) for work output. One study adjusted their work input measure to account for shared practice resources, while the other used an alternative measure for clinical time instead of FTE. Both studies found that modifying their measures for work input resulted in a more accurate and fair calculation for individual physician productivity.

The most robust new model of physician productivity reconceptualized what information should be used to calculate both work outputs and work inputs.[22] Strengths of this model, which was based on VHA data and informed by an evidence review and stakeholder panel input,[23] are that it incorporates patient-important outcomes such as quality, access, and experience and removes volume-based measures from the productivity equation. In this way, the model offers a distinctly different method to measure productivity that would seem to be a better fit with the overall VHA approach to care, which prioritizes patient-centeredness, quality, access, and cost containment. While designed for primary care clinics, this model could be modified for specialty medicine clinics and other types of outpatient practice settings.

The varied aims and approaches of the 3 studies included in this review illustrate how productivity measures can serve multiple different purposes depending on why they are being used and the problem they are trying to solve. For example, Butala et al[20] used their analysis of productivity adjusted for shared resources to create standard expectations for nurse practitioner to physician ratios and use of clinic rooms. Saeed et al[21] found that their revised definition of clinical time was a better predictor of wait times than measures based on FTE and could be used to evaluate clinic access. Tran et al[22] suggested that their productivity model would better account for the interprofessional teamwork hours that generate clinic outputs, and therefore fit better with the primary care "value proposition" than wRVU or volume-based metrics. As VHA continues to evolve its productivity standards, decision-makers may consider using the example of these studies to directly link efforts to increase physician productivity to the specific VHA problem trying to be solved.

LIMITATIONS

Available evidence regarding specialty medicine physician productivity measures has several limitations. First, the overall size of the literature base is small and of limited range. Data from cardiology practices are included, but other medicine subspecialties are not. While study findings may be applicable to general outpatient practice, some medicine subspecialty practice settings may have unique factors to consider when designing appropriate measures for their work output and input. Second, despite widespread concern that wRVU-based productivity metrics do not capture clinical work outside of patient encounters and therefore do not capture the scope of physician work output, no study directly proposed a measure or model to overcome this problem. Researchers with OPES have used VHA primary care data to develop proxy measures for unobserved workload and create a primary

care case-mix algorithm,[15] but the issue of underestimating actual workload in current VHA productivity calculations remains. Third, while we expected to find relevant studies conducted in non-US settings with applicability to VHA such as the United Kingdom, we did not. Given the small number of US studies that we identified, it is possible that no relevant studies have been conducted in countries with comparable integrated health care systems. If so, this finding highlights another evidence gap.

Limitations of this review include the subjective nature by which we operationalized definitions for *productivity* and other relevant terms such as efficiency. These terms lack standard definitions and are sometimes used interchangeably. We opted to include studies based on whether their aim to was to update some aspect of the "output/input = productivity" equation. We made this decision so that study findings could be compared to the VHA's current productivity definition, which is a version of the "output/input = productivity" equation. Other reviewers may have used a different approach, which could have resulted in different decisions regarding eligible studies.

FUTURE RESEARCH

VHA is unique among US health care systems in terms of its mission, funding, and accountability to Congress and American taxpayers. An argument could be made that VHA's unique status requires a unique approach to evaluating physician productivity, as well as the other metrics driving health care management decisions. Certain aspects of VHA care make overreliance on wRVU-based metrics particularly problematic. For example, increasing use of community care (health care paid for by VHA but delivered by non-VHA providers in the community) has required VHA physicians to spend more time on care coordination activities,[24] but this work usually takes place outside of patient encounters and is therefore not counted as productive according to the VHA's current definition.

In the short term, a risk of using a flawed measure (wRVUs) to assess physician work output is misjudging staffing needs and not providing VHA facilities with the resources that they need to meet patient demand. In the long term, continued reliance on wRVUs as a foundational aspect of US health care including VHA care presents threats to cost containment, as procedures and other services that generate more wRVUs are typically also more expensive to provide.[25] Similarly, sustaining a balanced physician workforce will become increasingly more difficult as fewer physicians will elect to enter specialties that are undervalued and lower paid yet still essential for patient care.[26]

As a learning health care system that is not dependent on wRVUs for payment, VHA is ideally positioned to develop and test innovative models to measure physician productivity that are aligned with the goal of delivering high-value patient-centered care. Although few in number, existing studies have demonstrated that productivity measures can be reimagined. Moreover, 2 of the 3 studies we identified were conducted within VHA, suggesting that VHA already has the data and expertise to advance this field.

Specific ways that VHA could improve upon current measures of physician productivity include:

- Adapting the model developed by Tran et al[22], which uses a holistic approach to measure clinic-level productivity, to evaluate specialty clinic settings. Using this kind of model to measure productivity would be more consistent with VHA's approach to care than a simple work output/input equation and could be used to improve clinic efficiency (how well clinics maximize outputs based on available inputs in terms of time and effort).

- Creating and testing a new measure set for asynchronous clinical work, perhaps one in which various work tasks completed outside of patient encounters are categorized and ranked according to cognitive effort and time requirements, and then applying this new measure set to physician productivity calculations.
- Ensuring that new models or measures developed for physician and clinic-level productivity calculations are based on available, accessible, and timely data and are therefore feasible to implement in practice.

CONCLUSIONS

We found that available evidence on specialty medicine physician productivity measures is limited. Two observational studies proposed modifications to work input measures but still used volume-based measures for work output. A third observational study described a promising new model developed using VHA primary care data that ties clinic-level productivity to patient outcomes. Important evidence gaps exist, including how to measure clinical work that is completed outside of patient encounters. As a learning health care system, VHA is uniquely positioned to implement and study alternatives to volume-based productivity metrics that align with the value-based outcomes that are important to patients, physicians, and society at large.

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